

PATENT COOPERATION TREATY

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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/JP2005/016686

International filing date (day/month/year)
05.09.2005

Priority date (day/month/year)
06.09.2004

International Patent Classification (IPC) or both national classification and IPC
G06F758

Applicant
SONY CORPORATION

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and Industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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**WRITTEN OPINION OF THE
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Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-11
	No: Claims	
Inventive step (IS)	Yes: Claims	3,4
	No: Claims	1,2,5-11
Industrial applicability (IA)	Yes: Claims	1-11
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V.

1. Reference is made to the following documents:

D1 : US 2003/204541 A1 (SHACKLEFORD J. BARRY ET AL) 30 October 2003
(2003-10-30)

D2 : DATABASE INSPEC [Online] THE INSTITUTION OF ELECTRICAL
ENGINEERS, STEVENAGE, GB; March 1999 (1999-03), CATTELL K ET AL:
"2-by-n hybrid cellular automata with regular configuration: theory and
application" XP002351999 Database accession no. 6222929

D3: DATABASE INSPEC [Online] THE INSTITUTION OF ELECTRICAL
ENGINEERS, STEVENAGE, GB; February 2003 (2003-02), SHENG-UEI GUAN
ET AL: "An evolutionary approach to the design of controllable cellular automata
structure for random number generation" XP002352000 Database accession
no. 7549824

2. Independent claim 1

Claim 1 is not allowable (Article 33(3) PCT) because it is obvious in view of D1 and D2, for the following reason:

D1 discloses the features of claim 1, except that the second sequence is generated by an LFSR (see D1, figure 3).

The problem to be solved is how to implement D1 with a single technology, that is: cellular automata.

The skilled person is well aware of the characteristics of 2-by-n automata, as disclosed in D2, and in particular that they are similar to those of LFSR's, ie. in that they can have maximal cycle length properties, as desired by D1. The skilled person would without inventive effort replace the LFSR of D1 by the automata of D2, and so arrive at claim 1.

3. Independent claims 9-11

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Claims 9-11 claim the same subject matter as claim 1, expressed in mere method, program and recording medium terms. These claims are not allowable either (Article 33(3) PCT), for reasons similar to those set out in point 2 above.

4. Dependent claims 2, 5-8

Dependent claims 2, 5-8 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step (Article 33(3) PCT), in particular:

- 4.1 The details of claim 2 are known from D1 and D2.
- 4.2 Claim 5 relates to two well known techniques for improving randomness, decimation and nonlinear mapping which a skilled person would apply without inventive effort.
- 4.3 Claims 6 and 7 are straightforward implementation details.
- 4.4 Claim 8 is a trivial application of the subject matter of claim 1.

5. Dependent claims 3 and 4

The combination of the features of dependent claim 3 is neither known from, nor rendered obvious by, the available prior art. The reasons are as follows:

In addition to the discussion in point 2 above, claim 3 further differs from D1 in that a controllable cellular automata is used, whose controls are generated by the two other automata. The output is the sum of the 3 automata.

The problem solved is how to further randomise the apparatus of D1.

Although a skilled person would arrive at claim 1, as discussed above, the further modifications needed to arrive at claim 3 are beyond his ordinary skills. Even if the controllable cellular automata is known, namely from D3, the specific configuration of claim 3 is outside the scope of normal experimentation and variation which a skilled

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person would carry out.

Hence, claim 3 is allowable. So therefore is claim 4, which is dependent on claim 3.